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UNIVERSITY OF TORONTO

Faculty of Dentistry

ANNUAL EXAMINATIONS

1964

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UNIVERSITY OF TORONTO
Faculty of Dentistry

Annual Examinations, 1964

First Dental Year

BIOCHEMISTRY

Answer any THREE questions

1. Discuss the factors influencing the rate of an enzymically catalysed reaction.

2. Discuss the relationship between the biosynthesis of proteins and the molecular mechanism of heredity.

3. Write brief notes on the nature and significance of the reactions catalysed by the following enzymes:

   (a) lactic dehydrogenase

   (b) 3-phosphoglyceraldehyde dehydrogenase

   (c) glucose-6-phosphate dehydrogenase

   (d) succinic dehydrogenase

4. Write structural formulae for and name:

   (a) an acidic amino acid

   (b) an aromatic amino acid

   (c) a hydroxyamino acid

   (d) a branched chain amino acid

4 continued:

Write formulae for three hexapeptides each of which contains the four amino acids of which you have given the formulae plus two residues of cysteine and which differ from each other by containing respectively:

(i) two thiol (sulphydryl) groups

(ii) an intra-chain disulphide bridge

(iii) an inter-chain disulphide bridge

Discuss briefly the importance of cysteine and cystine in protein structure and function.

5. Outline our present knowledge of the biosynthetic pathway for <u>either</u> (a) glycogen <u>or</u> (b) fatty acids. How do these differ from the way in which these compounds are degraded in the cell?

FINAL EXAMINATIONS

CHEMISTRY 216. January 18, 1964 13 pages (250 points)

General Instructions:

1. Use structural formulas in all answers

2. Read the questions carefully. In many cases you have been given a choice. If all questions are answered, the last ones will be omitted in the grading, so be sure to take advantage of the choice.

3. Check your examination paper to make sure you have all 13 pages.

1. (60 points). Write equations showing how ten of the following transformations could be carried out. Show all intermediate products, reagents and catalysts. You may use any other organic or inorganic reagents that you need.

1. 2-methylpropanal to valine.
2. cyclohexanol to cyclohexane-1,2-diol
3. m-nitroaniline to m-nitroiodobenzene
4. ethyl bromide to methyl ethyl ketone.
5. benzene to p-bromoaniline
6. 2-propanol to 2-methyl-1-proponal
7. phenol to aspirin
8. acetanilide to sulphanilamide
9. butanal to 2-ethyl-3-hydroxyhexanoic acid
10. acetaldehyde oxime to N-ethylbenzenesulphonamide.
11. toluene to methyl p-tolyl ketone.
12. benzene to m-nitrobenzoic acid.

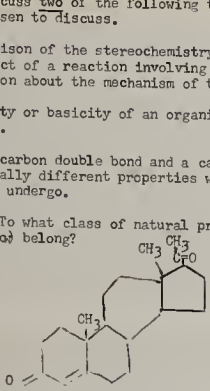
2. (40 points) Discuss two of the following topics. Indicate clearly which two you have chosen to discuss.

A. A comparison of the stereochemistry of the starting material and of the product of a reaction involving optically active molecules can give information about the mechanism of the reaction.

B. The acidity or basicity of an organic compound is a function of its structure.

C. A carbon-carbon double bond and a carbon-oxygen double bond have fundamentally different properties which are reflected in the reactions that they undergo.

3. (30 points). A. To what class of natural product does progesterone (structure given below) belong?



B. Describe the observations that you would make in the laboratory if the following reagents were added to progesterone. Write equations showing the relevant parts of the molecule.

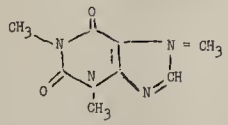
1. Br_2 in CCL_4

2. I_2 in NaOH

3. 2, 4 - dinitrophenylhydrazine reagent.

4. Cold, dilute $KMnO_4$

C. The natural product caffeine has the structural formula:



1. What heterocyclic ring system does it contain?
2. Would you expect the compound to be an organic base? Give reason for your reply.

4. (45 points). Use type equations, structural formulas or a sentence or two to illustrate or explain fifteen of the following terms in organic chemistry.

1. carbonium ion
2. piperidine
3. diastereoisomer
4. alkaloid
5. S_N1 reaction
6. Markownikoff's rule
7. thiazole
8. 1, 4-addition
9. terpene
10. pyrrolidine
11. γ - lactone
12. geometric isomerism
13. molecular rearrangement
14. plane polarized light
15. Sandmeyer reaction
16. resolution of racemic mixtures
17. free radical
18. optical rotation
19. nucleophilic addition.
20. relative and absolute configuration

5. (20 points) Compound A, $C_7H_{12}O_4$, is an optically active compound which dissolves in dilute sodium bicarbonate with the evolution of CO_2. Other tests on the compound show that it reacts with acetic anhydride to give a monoacetate, and also gives a yellow precipitate with iodine in basic solution. The other product of the iodoform reaction is Compound B, $C_6H_{10}O_5$, which also dissolves readily in dilute sodium bicarbonate and is not optically active.

A. List the fundamental groups that you know are present in Compound A.

B. Write plausible structural formulas for A and B.

6. (25 points) A. Write the full structural formula for a polypeptide containing four different amino acids and name it.

B. Use the Fischer peptide synthesis to build up half of your polypeptide and indicate how the synthesis could be continued.

7. (30 Points) Define or describe the following using structural formulas wherever possible.

1. an osazone
2. a ketohexose
3. a reducing sugar
4. a-D-glucose
5. mutarotation
6. invert sugar

UNIVERSITY OF TORONTO
Faculty of Dentistry

Annual Examinations 1964

First Dental Year

DENTAL AND COMPARATIVE DENTAL ANATOMY

Note: Answer parts A and B in separate books
All questions of equal value

PART A - DENTAL ANATOMY

1. Discuss the "static" factors that influence occlusion of the permanent teeth.

2. Describe the anatomical similarities and differences between each of the following pairs of teeth. Use sketches to illustrate.

   (a) Labial view of $\underline{3/}$ and $\overline{3/}$

   (b) Occlusal surface of $\underline{/4}$ and $\underline{/5}$

   (c) Buccal view of $\overline{/e}$ and $\overline{/6}$

   (d) Occlusal surface of $\underline{6/}$ and $\underline{7/}$

   (e) Labial view of $\underline{/1}$ and $\underline{/2}$

3. A child has the following dental formula:

6 e 4 c 2 1	1 2 c 4 e 6
6 e d 3 2 1	1 2 3 d e 6

   (a) How old is the child?

   (b) How will space be provided for the unerupted premolars?

3. (c) What factors operated to provide space for the erupted permanent anterior teeth?

4. Describe the contact relationships between upper and lower primary teeth in centric occlusion.

PART B - COMPARATIVE DENTAL ANATOMY

1. Give a brief account of the evolution of man from an insectivorous mammal, paying particular attention to evidence afforded by variations in the dentition, facial proportions, and cranial development.

2. Using a series of diagrams, develop the cusp pattern of the hominid upper and lower molars from the haplodont (i.e. single-cusped) tooth. All cusps must be fully labelled and diagrams properly oriented.

   What is a carnassial? What cusps are present on the upper and lower carnassials of a lion?

UNIVERSITY OF TORONTO
Faculty of Dentistry

Annual Examinations, 1964

FIRST DENTAL YEAR

GROSS ANATOMY

1. Give a complete account of the temporo-mandibular joint.

2. (a) List all the muscles which alter the shape of the tongue, and/or control its position relative to the palate.

   (b) Carefully describe the intrinsic and extrinsic muscles which contribute to the substance of the tongue.

   (c) Explain why the Genioglossus is called a "safety muscle".

3. Describe the maxillary nerve and its branches.

4. (a) Describe the features of the right atrium of the adult heart.

   (b) Explain the significance of the foramen ovale in foetal circulation.

5. Describe the anatomy of pain sensation.

UNIVERSITY OF TORONTO
Faculty of Dentistry

Annual Examinations, 1964

First Dental Year

HISTOLOGY

1. Discuss dental enamel under each of the following headings:

   (a) Structure of mature enamel

   (b) Synthesis of enamel matrix

   (c) Mineralization

2. Compare the origin, microscopic structure, and growth of bone and cementum.

3. What is the microscopic structure of the small intestine?

4. Describe the microscopic structure of the sublingual gland.

5. Describe the misroscopic structure of the suprarenal gland.

UNIVERSITY OF TORONTO
Faculty of Dentistry

Annual Examinations, 1964

Second Dental Year

BACTERIOLOGY

1. Explain the following terms using appropriate examples:

   (a) Impetigo
   (b) Inclusion body
   (c) Complement
   (d) Tyndallisation
   (e) Adjuvant

2. Write a short note on any two of the following:

   (a) Function of the morphological structures which cover the bacterial protoplasm.
   (b) Actinomycosis
   (c) Viral interference phenomenon
   (d) Serum hepatitis

3. Explain concisely, describing the media and other laboratory methods used, to isolate and identify the following organisms from the flora of man.

   (a) B. coli
   (b) B. proteus
   (c) Strep. viridans
   (d) Lactobacilli
   (e) Staphylococcus epidermicus

4. a) What mechanisms operate in vivo in acquired active immunity?

   b) What zones can be distinguished in vitro in the tritration of toxin with antitoxin? Are these the

same when sera of different animal species are used?

5. Discuss the role of Rh factors in blood transfusions.

6. What are the clinical and laboratory criteria which are used to diagnose a case of varicella and from which other diseases has it to be differentiated?

7. Under what circumstances are enterococci pathogenic. What are the laboratory procedures to isolate and identify this organism in these cases and what antibiotic therapy could be used?

8. What is the mode of action of penicillin? What organisms are sensitive to it? What relations between the host and parasite determine the dose and route of administration? In what instances should semi-synthetic penicillin derivatives be used.

9. What is the sequence of events during childhood and adult life which can lead to sub-acute bacterial endocarditis?

10. Write a short note on <u>any three</u> of the following:

(a) Thrush
(b) B.C.G.
(c) Polio vaccines
(d) Dick test
(e) Recurrent fever
(f) Adeno-virus infections

UNIVERSITY OF TORONTO
Faculty of Dentistry

Annual Examinations 1964

Second Dental Year

GENERAL PATHOLOGY

All 3 questions are to be answered. They are of equal value.

1. a) Describe the differences between a thrombus and a post mortem clot.

   b) Discuss the sequelae of thrombosis of a leg vein.

2. Describe fully the healing of an aseptic incision of the skin.

3. Multiple choice questions.

UNIVERSITY OF TORONTO
Faculty of Dentistry

Annual Examinations, 1964

Second Dental Year

PHYSIOLOGY

Answer only FIVE of the seven questions. The questions are of equal value.

1. (a) Describe nutritional and environmental factors that influence the number of red blood corpuscles in the circulation.

   (b) Discuss the role of coagulation in haemostasis. Explain the defect resulting in hemophilia.

2. (a) Briefly discuss the daily water balance in man under the headings of:

   i. Routes and amounts of loss under usual conditions of environment and activity.

   ii. Effects of vigorous muscular exercise.

   (b) i. Describe, by means of a table or diagram, the operation of the factors that are involved in the interchanges of fluid between blood and tissues.

   ii. Outline and explain at least three conditions or alterations that can cause accumulation of fluid in tissues.

3. (a) Outline the operation of the factors that regulate the heart rate (frequency of the beat) in man.

3. (b) Describe and explain the factors that maintain arterial blood pressure.

4. (a) Outline the control of respiration in man.

   (b) Describe the processes in the kidney that aid in regulation of the acid-base balance of the body.

5. (a) Outline the actions of deglutition in man, and the control of these actions.

   (b) Outline the various means whereby salivation is controlled in man.

6. Write concise notes on the following:

   (a) Basal metabolic rate.

   (b) Action potentials in nerve.

   (c) Characteristics of "spinal" reflex activity.

7. (a) Describe the effects (on blood, urine, tissues) produced by removal of the pancreas.

   (b) Outline effects associated with secretion by the adrenal medulla.

UNIVERSITY OF TORONTO
Faculty of Dentistry

27

Annual Examinations, 1964

THIRD DENTAL YEAR

MARKS

ANAESTHESIA

20 1. With the aid of a diagram, outline the origin, course and ~~insertion~~ distribution of the fifth cranial nerve.

20 2. a) List the indications for a true infra-orbital block.

b) In point form give the technique for this injection.

c) List the contra indications to the above injection.

20 3. Shortly after administering a tuberosity block, swelling is noticed. Discuss in point form this condition and how you would handle it.

20 4. Two days following a mandibular block for an operative procedure, a patient complains of swelling, tenderness and stiffness of the mandibular area: discuss this condition in point form and how you would handle it.

20 5. With the aid of a diagram, list in order of depression the areas of the central nervous system which are affected by a general anaesthetic.

UNIVERSITY OF TORONTO
Faculty of Dentistry

29

Annual Examinations, 1964

THIRD DENTAL YEAR

MARKS

GENERAL SURGERY

1. Describe the clinical features and treatment of a patient with a carcinoma of the lower lip.

2. Describe the clinical features, pathology and treatment of acute hematogenous osteomyelitis of the upper end of the tibia.

3. Describe the clinical feature of a simple fracture of a long bone.

4. Discuss briefly the management of a patient with an extensive burn.

5. Describe the clinical features and etiology of a thyroglossal cyst.

UNIVERSITY OF TORONTO
Faculty of Dentistry

Annual Examinations, 1964

THIRD DENTAL YEAR

NUTRITION AND PREVENTIVE DENTISTRY

Please answer parts A, B, and C in separate books.

MARKS NUTRITION PART A

8 1. For each of the following nutrients, list two functions and two excellent food sources:

(1) Vitamin A
(2) Thiamine
(3) Calcium
(4) Protein

12 2. Indicate, by name, the nutrients which are thought to be involved in tooth formation. Briefly indicate how they are thought to function in tooth formation.

8 3. Indicate what nutrients might be involved in the production of the following clinical conditions:

(1) hypochromic microcytic anemia
(2) macrocytic anemia
(3) subcutaneous haemorrhages
(4) habitual abortion in animals
(5) beriberi
(6) idiopathic hypercalcemia
(7) rickets.

5 4. List the factors which may affect the absorption and utilization of calcium.

PART B

17 5. Describe in detail the points which should be considered in assessing a patient's diet from both a nutritional and dental standpoint.

MARKS PREVENTIVE DENTISTRY - PART C

4 1. In brief point form, give four biological characteristics in which the mineralized tissues of an adult tooth differ from other calcified tissues of the body.

2 2. Name the main organic constituents of enamel and dentine.

6 3. By means of a drawing show and name the ionic composition of a hydroxyapatite crystal.

4 4. Dental caries of enamel decreases with age because of a "maturation process". Explain this statement in a sentence or two.

2 5. (a) Name two extrinsic and two intrinsic enzymes of saliva.
3 (b) What are the buffer components of saliva?
5 (c) What are the functions of saliva?

6. In dental caries prophylaxis, when would one recommend:
4 (a) Fluoride supplements
2 (b) Topical fluoride applications.

3 7. State briefly, three main conclusions derived from the "Vipeholm Study" on the cariogenicity of carbohydrates.

3 8. (a) Discuss the constituents of the dental plaque.
3 (b) Which organisms increase in numbers in a plaque under which caries is likely to develop?

6 9. In point form, give evidence which supports the 'Acid Decalcification' theory of dental caries.

3 10. What is the meaning and significance of the D.M.F. index?

Third Dental Year

ORAL PATHOLOGY

No Paper Available

#1

Orthodontics

UNIVERSITY OF TORONTO
Faculty of Dentistry

ANNUAL EXAMINATIONS 1964

Fourth Dental Year

Paper #1

ORTHODONTICS

1. A patient presented for orthodontic examination with the following history and data available:

The patient was a male aged thirteen years of age, of good intellect and scholastic achievement. He sucked his thumb until approximately age nine. There is a history of pronounced naso-respiratory allergy to housedust, feathers, cats, dogs and ragweed which is now being controlled. Other than the allergy there is no other history of chronic illness. There is no familial history of a similar orthodontic problem and no deciduous teeth were prematurely lost.

At present the patient breathes through his mouth and the lips are parted when the patient is at rest. The tonsils and adenoids have not been removed and are considered to be healthy and normal in size. He is in good general health at the present time.

The freeway space is normal and the closure path is a smooth arc from rest position to centric occlusion.

You will be given a set of study models, profile and full face photographs and a lateral cephalometric radiograph of this patient. Tracing materials consisting of tracing paper, protractor, ruler, tracing pencil and dividers will be provided.

MARKS:

5 (a) Using conventional terminology fully classify this malocclusion. (One sentence)

MARKS

5 (b) Do a conventional tracing of the anatomical structures shown on the patient's lateral cephalometric radiograph.

5 (c) Label on the tracing the following anatomical structures and landmarks:

1. Pterygomaxillary fissure
2. Uvula
3. Orbitale
4. Planum sphenoidale
5. Posterior nasal spine
6. Odontoid process
7. Coronoid process
8. Anterior nasal spine
9. Orbital process of the frontal bone
10. Pogonion

5 (d) Do a simple cephalometric analysis on the tracing, recording the measurements of angles and linear measurements used.

2½ (e) Using conventional anthropometric terminology describe the facial type. (One word)

2½ (f) Using conventional anthropometric terminology describe the profile type. (One word)

2½ (g) Describe the relationship of the mandibular denture to the basal bone as revealed by the cephalometric analysis. (One word)

7½ (h) 1. Does disharmony between tooth size and jaw size exist? List the reasons for your answer.

2. Will the extraction of permanent teeth be required to correct this malocclusion.

7½ (i) List the tooth movements which would be required to correct this malocclusion. Do not discuss appliances.

7½ (j) Could a general practitioner successfully treat this malocclusion with the limited mechanics available to him? If so tell how, if not tell why not.

#1

Pardodontics

UNIVERSITY OF TORONTO
Faculty of Dentistry

ANNUAL EXAMINATIONS 1964

Fourth Dental Year

Paper #1

PAEDODONTICS

MARKS

20 1. In point form, outline the advice to be given to the parent and the treatment plan for each of the following cases. Radiographs reveal that all teeth are present.

(a) In the mandible of a child the permanent central incisors have erupted and have replaced the deciduous central and lateral incisors. The distal surfaces of the permanent incisors are contacting the mesial surfaces of the deciduous cuspids.

(b) The same situation presents as in part (a) except there is a 3 mm. space occurring bilaterally between the deciduous cuspid and the permanent central incisor.

(c) In a normally developing mandible of a six year old child, the permanent central incisors have erupted lingually to deciduous incisors. The deciduous teeth are firm and in good alignment.

20 2. Anterior periapical radiographs for a nine year old child reveal that the maxillary permanent lateral incisors are congenitally missing. Discuss in point form:

MARKS

(a) Do the missing upper laterals indicate further possible related conditions in the mouth; if so explain.

(b) The choices of treatment for the patient.

(c) Why the choices were made.

10 3. A seven year old child is found to be pale and listless with gingival tissues showing signs of slight swelling throughout the whole mouth. The tissue bleeds readily when touched with a probe. What steps do you feel should be taken to determine the cause of this child's condition.

#2
Opnative

UNIVERSITY OF TORONTO
Faculty of Dentistry

ANNUAL EXAMINATIONS 1964

Fourth Dental Year

Paper #2

MARKS		OPERATIVE DENTISTRY
10	1.	Draw and describe the outline of an MO cavity for an upper first molar for a caries-immune mouth and the outline and description of a cavity for a caries susceptible mouth.
2	2.	List the surfaces where an amalgam restoration is acceptable in upper anterior teeth.
8	3.	List your reasons for selecting: (a) amalgam for a class V restoration (b) gold foil for a class V restoration
12	4.	Enumerate the indications for a porcelain jacket crown, a porcelain-fused-to metal crown, and a gold acrylic crown to restore an upper central incisor.
5	5.	List your selection of suitable bases under: (a) silicate (b) self-curing resin
5	6.	Describe your treatment filling for a near exposure of the pulp caused by caries in a molar.
8	7.	List the steps for the insertion of a reinforced amalgam restoration in a molar using stainless steel pins.

MARKS PROSTHODONTICS

15 1. In order to obtain laboratory assistance in partial fabrication, what information should be forwarded to the technician to obtain:

(a) cast framework

(b) try-in of the entire assemblage

(c) completed case for initial insertion

15 2. What influence do the following factors have on the compensating curve of a complete upper and lower prosthesis? Answer briefly.

(a) increased incisal guidance

(b) decreased cusp height

(c) increased condylar guidance

20 3. Describe in detail a procedure for the occlusal correction and mill-in of a complete upper and lower prosthesis.

UNIVERSITY OF TORONTO
Faculty of Dentistry

ANNUAL EXAMINATIONS, 1964

Fourth Dental Year

Paper #3

MEDICINE

MARKS

20 1. Discuss the oral manifestations of four systemic diseases.

15 2. Discuss acute rheumatic fever under the following headings:

a) causes

b) clinical signs and symptoms

c) treatment and prevention

15 3. Write a brief note on:

a) Haemophilia

b) Cirrhosis of the liver

c) Lung abscess

#3
Periodicals

UNIVERSITY OF TORONTO
Faculty of Dentistry

ANNUAL EXAMINATIONS 1964

Fourth Dental Year

Paper #3

PERIODONTICS

1. A male patient, age 25, good health history, complains that his gums are tender to touch and that they bleed freely when the tooth-brush is used or when hard food is chewed. He reports that his gums have bled a little during brushing for the last three or four years, but there was never any obvious discomfort until five days ago. Swelling and tenderness had started about the left wisdom tooth and had extended to involve the gums in a number of areas about his mouth within twenty-four hours. He reports a foul taste in his mouth and enlarged tender glands below the angles of the lower jaw.

The patient had lived at home, as a farmer, until about six months ago. He is now employed on a night-shift in a machine shop. He lives in a rooming house and eats at irregular hours in restaurants. He reports that he has lacked his usual energy during the past few weeks.

Direct clinical examination reveals twenty-eight fully erupted, well-arranged teeth and a partially erupted lower left third molar. The three remaining third molars have never erupted according to the patient. The gingival margins are thickened, shiny, and obviously redder than normal. Many of the interdental gingival papillae are slightly shortened, blunted and concave at the tip. On a few papillae there is a soft creamy mass of debris. These areas are tender and bleed freely when touched. A flap of gingival tissue over about half the occlusal surface of the left third molar is markedly swollen and tender to touch. The breath is foul. There are obvious amounts of soft debris and small amounts

of supra-gingival and sub-gingival calculus. There are five proximo-occlusal amalgam fillings, and interproximal food impaction is occurring regularly at two positions alongside fillings.

Numerous three and four millimeter pockets are present on the mesial and distal surfaces of the interdental papillae. Radiographic evidence shows slight cupping-out of the interdental alveolar process. Most incisors, cuspids and bicuspids have abnormal mobility one degree. This is most noticeable under influence of triturating or grinding action of the teeth.

There is an overbite of three millimeters and an 0-2 overjet. At the limit of the right or left lateral excursions of occlusal function there is contact between upper and lower cuspids only. At these positions the bicuspids and molars of the working side are separated approximately 1 to 2 millimeters and the teeth of the balancing side are separated about three millimeters. At the incisal position the bicuspids and molars are separated approximately three millimeters.

<u>Marks</u>

10 (a) What is the diagnosis of:
(i) the acute condition?
(ii) the preceding condition?

20 (b) (i) Outline concisely a plan of procedure for correction of the abnormalities. Indicate clearly the main divisions of therapeutic procedures which you propose.

(ii) What is the probable prognosis?

20 2. Discuss "mouth-breathing gingivitis" under the headings
(a) signs and symptoms
(b) significance
(c) etiology
(d) treatment
(e) prognosis

Fourth Dental Year

Paper # 4

DENTAL ORAL SURGERY & ANAESTHESIA

No Paper Available

UNIVERSITY OF TORONTO
Faculty of Dentistry

57

ANNUAL EXAMINATIONS, 1964

Fourth Dental Year

Paper #4

DENTAL RADIOLOGY

MARKS

17 1. (a) Describe briefly a method of taking a good periapical radiograph of the upper second molar region. Mention the difficulties that may be encountered in this area and how they may be overcome.

(b) For what purposes is a posterior bitewing radiograph used, and what points should be looked for to determine if it has been taken correctly.

(c) Name two projections using occlusal type film. Describe briefly your technique for taking either one of these two projections.

16 2. Discuss the developmental abnormalities effecting the teeth and jaws which are visible radiographically.

17 3. Describe the radiographic appearance of the following:

a) Disuse atrophy

b) Bone remodelling following surgical procedures.

c) Periapical osteofibrosis (cementoma).

d) Fibrous dysplasia.

#5

UNIVERSITY OF TORONTO
Faculty of Dentistry

ANNUAL EXAMINATIONS 1964

Fourth Dental Year

Paper #5

Marks

DENTAL PUBLIC HEALTH

10 1. State five characteristics of dental practice which reflect an understanding of public health responsibilities by the dentist.

15 2. A request is received to establish a local dental public health program in a community where none presently exists.

(a) Give five factors which should be considered before proceeding.

(b) Describe a standardized method of organization by listing the steps to be taken to establish such a program.

ENDODONTICS

10 1. A patient presents with a pulp involved maxillary molar tooth. After careful consideration of the problem you decide against the advisability of accepting the case for treatment. Give four contraindications upon which you might have based your decision.

5 2. Give the locations where you would prefer to use silver points to obliterate the root canal or canals. Explain briefly your reason for such selection.

Marks

10 3. Describe briefly the technic which you would follow to obliterate the root canal of an incompletely calcified root (open apex) so that you would be assured of a properly positioned and condensed root canal filling.

PRACTICE MANAGEMENT

10 1. What factors should be considered in establishing a fee for dental services?

15 2. (a) List the office records that are essential for the efficient administration of a dental practice.

(b) Describe the use of two of them.

PREVENTIVE DENTISTRY

25 1. Briefly discuss carbohydrates and dental caries under the following headings:

(a) Evidence of involvement of carbohydrates in the caries process.

(b) Mechanism of action of carbohydrates in the caries process.

(c) Factors determining cariogenicity of carbohydrates.

UNIVERSITY OF TORONTO
Faculty of Dentistry

Annual Examinations, 1964

First Year Dental Hygiene

BACTERIOLOGY

1. Explain the following terms using an example in each case:

   (a) Anaerobic organism

   (b) Bacterial growth factor

   (c) Symbiosis

   (d) Virulence

   (e) Complement

2. Describe shortly the natural host defence mechanism.

3. Name at least four differences between exotoxins and endotoxins.

4. Explain the use of a Widal reaction in the diagnosis of a bacterial disease.

5. Write a short note about the mechanisms involved in hay fever, and how can it be treated.

6. Discuss the importance of the Rh blood factor and how can the occurrence of an antibody against it be detected.

7. What is the sequence of events during childhood and adult life which can lead to sub-acute bacterial endocarditis.

8. What are the mechanisms involved in the arrest and healing of acute diseases caused by:

   (a) staphylococcus
   (b) streptococcus
   (c) pneumococcus.

9. What is the pathogenesis of tetanus and how can it be prevented.

10. Write a short note about any <u>three</u> of the following:

   (a) Scarlet fever
   (b) Chicken pox
   (c) Polio vaccines
   (d) Shick test
   (e) Diseases caused by enterococci

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67

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First Year Dental Hygiene
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ENGLISH COMPOSITION

Write an essay of approximately 1500 words on one of the following topics. Pay particular attention to planning your material and expressing yourself accurately.

1. The importance of historical traditions, political or social, in the national survival of any modern Western state. Give specific arguments and examples.

2. "The future struggle for the survival of Western culture may not be couched so much in a battle between East and West as in a battle between thinking men and Madison Avenue." Discuss.

3. We hear much of the American domination of Canadian culture. Discuss the extent to which you believe that a Canadian identity exists.

4. How effective or meaningful do you consider the influence of your elders to have been in the formulation of your career ambitions? How influential do you think they should be?

UNIVERSITY OF TORONTO
Faculty of Dentistry

Annual Examinations, 1964

First Year Dental Hygiene
First Year Pharmacy

ENGLISH LITERATURE

Answer all three questions.

1. Either
   a) "Both Swift and Mark Twain attack what they consider to be central corruptions in human nature." Making specific references to Gulliver's Travels and Huckleberry Finn, compare and contrast the opinions of these authors in this respect.

   Or
   b) "Huckleberry Finn and The Portrait of the Artist are novels related from the point of view of a single character." Discuss the ways in which the very different purposes of Mark Twain and James Joyce are served by this means.

2. Either
   a) "Cleopatra is among the most vital and engaging of Shakespeare's tragic heroines." Discuss what you consider to be the most important dramatic means employed by Shakespeare in the revelation of her character.

   Or
   b) "Milton's Samson Agonistes and Miller's Death of a Salesman represent widely different conceptions of tragedy." In the light of this statement, compare and contrast the dramatic aims of the two authors.

3. Write an appreciation of the following poem, paying particular attention to imagery, sound patterning or cadence, structure and the author's purpose in writing the poem.

The Sunlight on the Garden

The sunlight on the garden
Hardens and grows cold,
We cannot cage the minute
Within its nets of gold.
When all is told
We cannot beg for pardon.

Our freedom as free lances
Advances towards its end,
The earth compels, upon it
Sonnets and birds descend,
And soon, my friend,
We shall have no time for dances.

The sky was good for flying
Defying the church bells
And every evil iron
Siren and what it tells.
The earth compels,
We are dying, Egypt, dying

And not expecting pardon,
Hardened in heart anew,
But glad to have sat under
Thunder and rain with you,
And grateful too
For sunlight on the garden.

Louis Macneice

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Faculty of Dentistry

Annual Examinations, 1964

First Year Dental Hygiene

FOOD CHEMISTRY

PLEASE ANSWER ALL 5 QUESTIONS

1. (a) Give an example of, and a formula for, each of the following:

   (1) fat (2) carboxylic acid (3) ester (4) alcohol (5) trihydric alcohol (6) fatty acid (7) tertiary alcohol (8) ketone (9) disaccharide (10) aldehyde.

   (b) How do (1) alkanes, (2) alkenes and (3) alkynes differ in structure? Tell something about the chemistry of each type, and a structural formula for one of each.

2. (a) Tell briefly how soap is made from a fat and give an equation for the reaction, naming the substances involved.

   (b) What is the "curd" that forms when soap is added to "hard" water? Write an equation for this reaction.

   (c) What is hydrogenation of an oil? Of what industrial importance is this process?

3. (a) List 8 carbohydrates and classify them generally, according to molecular size.

   (b) Name the small carbohydrates that make up the larger ones, chosen by you in (a), in each of your examples.

   (c) Show by structural formulae, the differences between an aldose and a ketose.

   (d) Name each substance chosen in (c) and tell a food in which each may be found.

4. (a) What compounds are named by adding the suffix "ase"? Give some chemical information about these substances.

   (b) Give a general formula for an "amino acid" showing why it is so named.

   (c) What is a "peptide bond"? Illustrate using structural formulae.

   (d) What is the significance of amino acids and peptide linkages in protein?

   (e) Why are proteins important in the diet? Be brief.

5. (1) What are the sites of digestion of protein in the body?

   (2) How do conditions differ in these two locations?

   (3) What enzymes are responsible for protein digestion?

   (4) Tell the products formed in each case.

UNIVERSITY OF TORONTO
Faculty of Dentistry

Annual Examinations, 1964

First Year Dental Hygiene

GROSS AND DENTAL ANATOMY

Please write part A and part B in separate books.
Each part constitutes 50% of the paper.

PART A - DENTAL ANATOMY

1 a) Define the terms: variation, anomaly.

b) Prepare a classification of variations and anomalies. Give an example for each division and subdivision in your classification with reasons why it occurred.

2. You are advising a mother on the care of the dentition of her two year old child. List reasons why she should have the child's teeth examined regularly.

3. a) The upper permanent anterior teeth are much wider mesiodistally than the primary teeth which they replace. How do the permanent anteriors find space to erupt into the arch?

b) Describe how the upper and lower first permanent molars erupt into correct centric relation. In your answer, consider the various terminal planes at the distal of the second primary molars.

PART B - GROSS ANATOMY

Diagrams should be used to illustrate your answers.

1. Describe the muscles of mastication under the following headings:

   (a) Origin
   (b) Insertion
   (c) Nerve supply
   (d) Action

2. Write short notes on:

   (a) The submandibular gland
   (b) The maxillary sinus (antrum)
   (c) The soft palate
   (d) The facial artery

3. Give an account of the respiratory passages and lungs.

UNIVERSITY OF TORONTO
Faculty of Dentistry

Annual Examinations - 1964

FIRST YEAR DENTAL HYGIENE

HISTOLOGY

Please write parts A and B in separate books

Part "A" - General Histology

MARKS

1. By means of a fully labelled drawing illustrate the structure of a peripheral nerve.

2. Write a short note on each of the following:

   a) osteoclast
   b) basement membrane
   c) diapedesis
   d) reticulocyte
   e) plasma cell

3. Discuss the mechanism by which bone grows.

* * * * * * * *

Part "B" - Dental Histology

MARKS

4. By means of a fully labelled drawing illustrate the microscopic anatomy of the periodontal ligament.

5. a) Classify oral mucous membranes.

   b) Make a labelled drawing of the lip to illustrate the microscopic anatomy of the covering epidermis, the lining mucous membrane and the transition zone (or vermilion border) of this structure.

MARKS

6. Write notes on each of the following:

   a) perikymata
   b) enamel spindle
   c) cementocyte
   d) sharpey's fibers
   e) interglobular dentin

7. a) Name the two primordia from which the structures of the oral cavity and face develop.

   b) From what embryonic layers are the following derived:

      1) enamel
      2) dentin
      3) cementum
      4) pulp
      5) enamel organ
      6) periodontal ligament

   c) Name the primordium from which the premaxilla develops.

   d) What is the fate of the:

      1) enamel organ
      2) dental papilla
      3) dental follicle

UNIVERSITY OF TORONTO
Faculty of Dentistry

Annual Examinations, 1964

First Year Dental Hygiene

Part "A" - ORIENTATION TO DENTISTRY

MARKS Please answer parts A and B in separate books

9 1. Give three uses for each of the following instruments:

(a) Mouth mirror
(b) Explorer
(c) Periodontal probe

16 2. Define:

(a) Examination of a patient
(b) Signs of disease
(c) Prognosis
(d) Professional objective of a clinical examination

20 3. Using the form provided, chart the following:

Patient, male, age 35 - Mr. John Smith
Student - your own name
Physician - Dr. Alan Jones

Mr. Smith had rheumatic fever at age 9, and was hospitalized for two months at that time.

6 | / 4 5 6 missing, 8 | 8 unerupted

6 / over-erupted 3 mm., / 7 8 drifted mesially

2 1 | 1 2 recession labial and lingual

Hypertrophy of the papilla between 1/ and /1 on the labial.

3 mm. pocket on the mesial buccal aspect of 7/.

4 mm. pocket on the mesial lingual aspect of /3.

3/ Hypoplasia - labial - 3/4 of crown involved.

/3 Erosion at the gingival margin of the crown.

2 mm. space between 1/ and /1.

Loose contact between /4 and /5.

5 4. What precautions should be taken before proceeding with superficial scaling for the patient whose history you have charted in Question No. 3, and why is this precaution considered necessary?

Part "B" - PRE-CLINICAL TRAINING

3 1. (a) Give the definition of the Dental Hygienist.

2 (b) Give the aim of the Dental Hygienist.

5 (c) List five desirable qualities of a Dental Hygienist.

10 2. Describe in point form the technique for the topical application of Stannous Fluoride.

15 3. Using a comparison table, differentiate between supra-gingival and sub-gingival calculus.

4. Discuss the following principles as they apply to scaling:

5 (a) Hand Grasp

5 (b) Finger Rest

5 (c) Motion and Adaptation

First Dental Year Hygiene

PSYCHOLOGY Ip

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Faculty of Dentistry

Annual Examinations, 1964

Second Year Dental Hygiene

MARKS

DENTAL PUBLIC HEALTH

20 1. If you were seeking employment in public health:

a) Under what legislation would your employment be regulated as to:
 i License to practise dental hygiene?
 ii Employment in a Division of Dental Public Health in a Health Unit?

b) To whom would you be responsible in a Health Unit, Division of Dental Public Health?

c) List what you consider a dental hygienist's responsibilities might be in an ideally constituted Health Unit dental health program.

15 2. Dental notification cards are sent home to advise parents about dental defects disclosed by dental inspection of school children. What items of information are recorded on such a card

a) to identify the child, and
b) to describe the defects found.
c) Should quantitative information (e.g. number of cavities, etc.) be included or omitted? State reasons for your choice.

15 3. A county health unit embracing five townships will introduce a new dental public health program. Program evaluation will be based on annual examinations of samples of elementary school children in each township.

a) State the requirements of a sample that is to be a miniature of the total elementary school population.

b) Describe briefly the two types of collation books used for systematic array of statistical information derived from these annual sampling examinations.

MARKS

c) Describe the purposes of a "Record of Data Source" sheet in these collation books.

15 4. a) Differentiate between the establishment of a Health Unit Board and a Board of Health in Metropolitan Toronto.

b) List the health services one would expect to find in a Health Unit serving a rural-urban community of 100,000 population.

c) What principles of public health procedure are indicated in 4(b) above.

15 5. a) List the steps you would take in carrying out the dental examination of school children in a newly established Health Unit area.

b) How would you use the opportunity for dental health education in your activities in 5(a)?

c) What media of communication could be used to make this educational effort effective?

20 6. Briefly answer <u>four</u> of the following:

a) Categorize preventive measures according to the Dental Public Health Policy of the Canadian Dental Association.

b) State principles suggested for the use of instructional dental health films.

c) Give reasons for using the contribution made by voluntary lay organizations in instituting a dental health program.

d) Describe the technique for the effective use of topical fluoride.

e) Describe what is meant by acquired immunity and list two types.

f) Give reasons why a child should come under early and regular care of the family dentist.

Second Year Dental Hygiene

DENTAL RADIOGRAPHY

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Faculty of Dentistry

Annual Examinations, 1964

Second Year Dental Hygiene

PATHOLOGY

1. Name five forms of haemorrhage and explain how they differ from one another.

2. Describe the development of a pulp polyp.

3. Describe in proper sequence the process of healing by granulation.

4. Describe the meaning of the term resolution and give an example.

5. What is an embolus and how may its course be influenced?

6. Explain why teeth with necrotic pulps may appear bluish gray and more opaque.

7. Why should periapical dental granulomas be eradicated?

8. What is anodontia and how does it occur?

PHARMACOLOGY

Please use separate book.

1. What is meant by the following terms? Give one example of each:

   (a) Caustic
   (b) Antibiotic
   (c) Hypnotic
   (d) Analgesic

2. (a) What are the effects of a therapeutic dose of a fast-acting barbiturate?

   (b) What is the danger of an overdose?

3. What are the effects of a therapeutic dose of meperidine hydrochloride (Demerol)?

4. (a) Name three antibiotics which may be prescribed for systemic use.

   (b) Name one antibiotic which may be used topically.

5. Give one example for each of the following:

   (a) Parasympathetic depressant

   (b) Analgesic for severe pain

   (c) Vasoconstrictor

   (d) Cerebral stimulant

UNIVERSITY OF TORONTO
Faculty of Dentistry

Annual Examinations, 1964

Second Year Dental Hygiene

PHYSIOLOGY

Be relevant. Write legibly. Answer all questions. The questions are of equal value.

1. Write notes on:

   (a) Heparin and Dicoumarol

   (b) Causes of edema.

2. Discuss the significance of blood groups with respect to blood transfusion.

3. Give an account of O_2 and CO_2 transport in blood: discuss gas exchange in lungs and peripheral tissues.

4. Discuss the following:

   (a) The composition and function of the bile.

   (b) The exocrine and endocrine function of the pancreas.

5. Give a brief explanation of the following terms:

   (a) hyperpyrexia
   (b) hyperemia
   (c) amylase
   (d) intrinsic factor
   (e) reticulocyte
   (f) chyme

UNIVERSITY OF TORONTO
Faculty of Dentistry

Annual Examinations, 1964

Second Year Dental Hygiene

PREVENTIVE DENTISTRY

MARKS Please answer each question in a separate book.

20 1. Describe in detail the procedure to follow in diet counselling, and the recommendations which should be made in each of the following cases:

(a) An adult with a fair diet, rampant caries, L.Acidophilus count 1,000.000, Swab pH 3.6 - exceptionally cooperative.

(b) Same as (a) but diet poor and patient's co-operation doubtful.

(c) A girl 15 years of age with a diet low in milk, citrus fruit and cod liver oil, high in carbohydrates but with a low caries susceptibility and low counts.

(d) A patient with a diet which is good nutritionally but high in carbohydrates with a high count and medium susceptibility.

13 2. (a) Discuss the suitability of milk as a dietary source of the required nutrients for
(i) the infant up to 1 month of age
(ii) the one year old child
(iii) the adult

7 (b) State the intake of milk recommended by Canada's Food Guide for the child, adolescent, and adult.

What suggestions could be made to a mother, whose child disliked milk, to ensure, for the child, a reasonably adequate intake of milk

MARKS

2.(b) continued:

or of the important nutrients contained in milk.

20 3.(a) Describe briefly in one or two sentences what is meant by:

i invagination
ii hypocalcification
iii "ugly duckling"
iv ectopic eruption
v intra-alveolar space maintainer

(b) List the indications and contra-indications for space maintainers.

20 4.(a) What do you feel is the single most important duty of the hygienist in the orthodontist's office.

(b) Outline the steps in the fitting of an incisor pinch band.

5 5.(a) What factors influence acid production in a dental plaque?

6 (b) Name the chemical constituents of enamel that

(i) increase caries susceptibility
(ii) decrease caries susceptibility

9 (c) Make a representative drawing of a hydroxyapatite crystal showing its ionic composition.

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SOCIOLOGY Ia

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